

STRATHCLYDE

DISCUSSION PAPERS IN ECONOMICS



NICOLAS KALDOR, INCREASING RETURNS AND VERDOORN'S LAW

BY

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No 20-02

**DEPARTMENT OF ECONOMICS
UNIVERSITY OF STRATHCLYDE
GLASGOW**

Nicholas Kaldor, Increasing Returns and Verdoorn's Law

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Abstract

Kaldor, a student of Allyn Young, made much of Verdoorn's Law but the evidence for this 'law' is at best mixed. Verdoorn himself in his 1980 *Economic Journal* paper made it clear that his law did not have as general a validity as he had earlier believed. Evidence suggests that it is possible for agricultural productivity to grow many times faster than that in manufacturing, as in the US during 1947-84. Also, Young (1928) himself did not regard the law of diminishing returns as useful for prophesying the prospects of agriculture as the agricultural fields of newer lands had been brought closer to the older world through revolution in transportation and technical change in agriculture. Moreover, the logic of Verdoorn's Law of favouring manufacturing at the cost of other sectors distorts intersectoral relationships, leads to adverse terms of trade for agriculture, and is likely to pose a demand constraint for industry itself. To undo one wrong (i.e., protection to industry), one has to match it with other wrongs like price support and marketing board in agriculture, and dual exchange rates to promote exports. The whole economic system becomes an intricate maze with adverse consequences for growth and productivity for the whole economy.

Keywords: Verdoorn's Law, Increasing returns, Nicholas Kaldor, Allyn Young, Lauchlin Currie

JEL: B10, B20, B31, O21, O14, O41

1. Introduction

Nicholas Kaldor was Hungarian by birth but made England his home.² He was a distinguished economist making important contributions in the areas of growth, distribution, capital theory, trade cycles, and welfare economics. According to *The Economist* (20th January 1979), he 'was the best known economist in the world not to have received the Nobel Prize'. In the post-war

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² In this regard Kaldor's biographer Anthony Thirlwall (1987a, p. 519) writes: "His background was Hungarian, but like so many European émigrés, he became more English than the English and reveled in her institutions."

period he turned his attention to policy making and emerged as one of the foremost applied economists of his era. He was widely sought after for policy advice not only in Britain but also in developing countries such as India and Sri Lanka. He was highly critical of neoclassical equilibrium theory in terms of its relevance and the realism of its assumptions. His understanding of the growth or development process was based on the sharp distinction between an increasing returns sector (industry) and one with diminishing returns (agriculture).

In focusing on increasing returns, he was influenced by Adam Smith's (1776) analysis of the division of labour in the first three chapters of the *Wealth of Nations*, and Young's famous 1928 paper on increasing returns and economic progress. Smith had stated that the division of labour is limited by the size of the market. Young (1928), building on Smith, cast this in terms of cumulative causation and came to the conclusion that the division of labour in large part depends on the division of labour itself. This was more than a tautology as forces making for disequilibrium are continuously defeating those making for equilibrium.

In Smith's view growth occurs in a well-functioning market system where the state is confined to a few basic tasks. He studied the various systems of political economy and concluded that growth was best promoted by a system of natural liberty. This comes into being on its own when all preferences and restraints are removed. The institutional arrangements in natural liberty ensure two things: liberty and security. Once these are provided then the natural effort of each individual to better his condition is such a powerful motive force that it is capable of taking not only him but the whole society to wealth and riches.

While Smith generally favoured self interest as a means to the promotion of public interest, there were limited areas in which self interest came into conflict with the broader public interest. Thus, for example, Smith favoured intervention in providing publicly funded education for the poor to overcome potential ill effects of the division of labour. Likewise he advocated publicly funded public-health measures to remove offensive diseases such as leprosy. Smith realized that businessmen sought monopoly profits if this could be had through their conspiring to raise prices. So the best way to keep this excessive greed in check was to subject them to competition from both domestic and foreign enterprise. Thus, Young interpreted Smith not so much as a champion of laissez faire as of competition. In the Smith-Young view it is the stress on competition and the policy framework of 'no favours, no handicaps' which emerges as crucial to growth.

Although Kaldor was influenced in many ways by the Smith-Young approach to increasing returns, in his policy orientation he deviated substantially from their stress on natural liberty and competition. He thought manufacturing was special and had to be promoted by policies

such as protection, subsidies, dual exchange rates, and a selective employment tax.³ Thirlwall (1987b, p. 11), stated that Kaldor was even more dirigiste in his policy approach than Keynes. Thus Kaldor appears to have allowed his admiration for Smith and Young to be subordinated to Verdoorn's Law. This 'law' stated that growth of manufacturing productivity was more heavily dependent on growth of manufacturing output than is the case in other sectors. Kaldor had an empirical bent of mind and his empirical analysis showed that cross-country differences in overall growth rates arose largely because of differences in manufacturing productivity.

P. J. Verdoorn's (1949) paper was written in Italian, and therefore may explain its long neglect. Thirlwall (1987b, pp. 188-89) mentions that Kaldor was the first to use the term Verdoorn's Law in print though he had heard Kenneth Arrow use it in conversations in models of learning by doing. Writing in English in the *Economic Journal* article 'Verdoorn's Law in Retrospect: A Comment' in 1980, Verdoorn clarified that the so-called law attributed him was much less generally valid than what he was led to believe in 1949.

Kaldor, however, made much of the Verdoorn's Law and the objective of this paper is to examine the validity of this alleged law and whether it justifies special treatment to manufacturing. The paper is structured as follows. The next section takes up a review of the Smith-Young approach to increasing returns and shows that Kaldor was not much guided by this framework when it came to policy making.⁴ He was more guided by empirical observations with respect to the applicability of Verdoorn's Law. Section 3 critically reviews Verdoorn's Law particularly in so far as Verdoorn himself was not fully convinced of its general applicability. Section 4 highlights correspondence between Kaldor and Lauchlin Currie in this regard and brings out their differing views on both agriculture and industry. Section 5 concludes the paper.

2. The Smith-Young Approach

In Smith the division of labour is central to his explanation of growth. But the division of labour is limited by the size of the market, so extension of the market – through transport and communication internally and through free international trade externally – becomes crucial in promoting growth. As noted above, Young cast Smith's dictum in terms of cumulative causation and came to the conclusion that the division of labour in large part depends on the division of

³ First stage import substitution under moderate protection can always be justified on infant industry grounds as all latecomers to industrialisation such as Germany and USA had to protect their industries. However in its second stage, import substitution can give rise to significant distortions with the persistence or extension of licenses and exchange and quantitative controls, and an excessively dominant role for the public sector that takes it well beyond public utilities and social infrastructure, jeopardizing comparative advantage. See Balassa (1980).

⁴ "As a deviser of ingenious schemes, he had no equal; 'the last great innovator' as Professor Ken Galbraith once described him. His view of economics as a moral science – as a branch of ethics in the Cambridge tradition – motivated much of his writing, and led him into policy making at the highest level as a special Adviser to three British (Labour) Chancellors of the Exchequer, and as an adviser to several developing countries" (Thirlwall 1987a, p. 519).

labour itself. From this Currie drew the conclusion that the main cause of growth is growth itself.

This framework leads to a generalized or macroeconomic notion of increasing returns. Young explicitly stated that if we pay too much attention to the operation of a single firm or industry we are likely to miss increasing returns, and industrial operations are to be treated as an integrated whole. Increasing returns take the form of pecuniary external economies rather than internal economies of scale. Young also maintained that increasing returns had relatively little to do with any relationship between prime (or variable) and supplementary (or fixed) costs, unlike Marshall's (1890) focus. It was large production at the macroeconomic level rather than large-scale production at the firm or industry level that permitted increasing returns (Young 1990, p. 54).

Buchanan and Yoon (2000) also stated that the Smithian proposition between the relationship between the division of labour and the size of the market does not require any distinction between separate sectors or industries. All it implies is that the larger exchange nexus is more efficient than the smaller one for the division of labour (or specialization) to be more fully exploited. Currie (1981, p. 54) also maintained that Young was reluctant to speak of an increasing returns sector even as a hypothetical example, for any such attempt is bound to result in Clapham's (1922) empty economic boxes. He was also skeptical of any artificial distinction between agriculture and industry for the understanding of increasing returns. In Youngian terminology the market is to be treated as an aggregate of economic activities tied together by trade. This implies that expansion of one sector leads to an increase in the demand for the products of other sectors, and that this expansion of other sectors in turn fuels growth in the original sector. The entire economy is tied in a reciprocal exchange relationship among its various sectors including agriculture.

Kaldor on the other hand made a hard-and-fast distinction between industry as the increasing returns sector and agriculture as the diminishing returns sector. He thought that since in this sense industry was special it had to be artificially promoted through policy. Chandra (2019) also shows that Kaldor's sectoral approach to increasing returns went against the Smithian notion of natural liberty, or the Smith-Young stress on competition, for his approach distorts intersectoral relationships rather than facilitating exchange between them. Economic theory did not go astray from the middle of chapter 4 of the *Wealth of Nations* as Kaldor lamented. Further, an appreciation of the institutional context of growth in Kaldor is also missing.⁵ Thus, to repeat, while Kaldor was much influenced by the Smith-Young approach in theory, when it came to policy making he trusted his empirical bent of mind more. In Smith and Young winners and losers emerge from the competitive race itself and cannot be identified a priori for policy

⁵ See also Chandra (2020), chapter 4.

purposes. Kaldor on the other hand thought that winners could be picked and promoted through policy.

While Kaldor agreed with Young that an increase in demand would create its own supply, he disagreed that an increase in supply would automatically create its own demand unless supplemented by Keynesian aggregate demand to finance the resulting 'induced' investment. He reasoned that an increase in the supply of a good in elastic demand would divert purchasing power from other goods (whose demand is inelastic), and that unless credit is expanded to finance inventory accumulation in other goods there will be a shortfall in aggregate demand. This reasoning is faulty because it assumes that total purchasing power remains fixed, so that a diversion of purchasing power to an elastically demanded good leaves less purchasing power for other goods. Here Kaldor clearly slips into neoclassical opportunity-cost thinking. In a growing market purchasing power is constantly expanding, so while the share of elastically demanded goods increases over time, it does not imply that there is an absolute decline in inelastically demanded goods. Though their share may fall over time, this is consistent with an absolute increase in their supply and demand. For example, the share of industry may increase over time and that of agriculture shrink with growth but this is consistent with an absolute increase in the size of agriculture. Development experience shows that even the absolute size of agriculture expands over time with economic growth, despite (or even because) manpower and other resources are released for use in industry.⁶

Young had clearly stated that different industries will grow at different rates depending on the elasticities of demand and supply. But even inelastically demanded goods expand with economic growth, albeit at a slower rate than the elastically demanded goods. Secondly, as resources get diverted from less to more productive uses, producers who remain in the relatively contracting sector (notably agriculture) also benefit from an increase in the general scale of production. Young (1928, p. 535) observes:

The demand for some products is inelastic, or, with an increasing supply, soon becomes so. The producers of such commodities, however, often share in the advantages of the general scale of production in related industries, and so far as they do productive resources are released for other uses.

The important point as stressed by Young is that industrial operations should be seen as an integrated whole. Again, the market in an inclusive sense is an aggregate of productive

⁶ In a letter to Lauchlin Currie dated 30th April 1979, Roger Sandilands wrote: "I think Kaldor is confusing absolute and relative markets. If commodity A is in elastic demand when it experiences an innovation which enables it to expand supply/demand, it will increase its *share* of the total market and the share of other products will fall. But this does not mean that the *absolute level* of output of other commodities falls. On the contrary, that is rising. This *must* be the case if the demand for product A is elastic since, by definition, when 'total revenue' for industry A increases, this means that total supply of other products has increased in exchange."

activities held together by trade. With all sectors in a reciprocal relationship with each other we can again see that expansion of one sector fuels demand for the products of the rest of the economy; and expansion of those other sectors then would fuel demand for the products of the original sector. In the process, goods with inelastic demand also benefit both in terms of absolute expansion (though not relative), despite and also because of the release of productive resources for other more profitable uses.

Young's reciprocal supply-demand mechanism included the whole economy including agriculture.⁷ He thought that though the law of diminishing returns was operative as a tendency in agriculture, it could be overcome by more powerful counterforces such as improvement in the means of transport and induced innovations in agriculture. As a result he insisted that the law of diminishing returns is quite useless as a prophecy. Young (Ely et al. 1923, pp. 414-5) also noted that rents in the older parts of the world had not increased (as might otherwise have been expected) thanks to the import of foodgrains from the newer parts of the world. In fact, in recent decades US agricultural productivity has grown much faster than manufacturing productivity. Citing evidence from the *Economic Report of the President* (1986), Sandilands (1990, p. 409, n. 29) writes: "From 1947-84 agricultural output per man-hour rose from an index of 16 to 139 (1977 = 100), increasing more than 8 times, while the index for the nonfarm business sector only doubled from 52 to 104."

Currie (1974a, 1997) objected to Kaldor's interpretation of Young's notion of increasing returns on a number of counts. While Young was talking about a macroeconomic notion of increasing returns (as increasing returns also applied to agriculture), Kaldor thought that increasing returns were confined to manufacturing only. Secondly, Young was talking of barter terms of trade between sectors; Kaldor on the other hand introduced monetary factors into the picture. As noted by Turner (1993, p. 145), Currie "objected to Kaldor's alleged addition of Keynesian analysis to Young's."⁸ Thirdly, while Kaldor thought investment to be autonomous, in line with Keynes, Currie thought that investment was endogenous, largely financed via the expansion of business profits and firms' retained earnings. Fourthly, Currie also objected to Kaldor's reasoning regarding substitution of purchasing power in favour of an elastically demanded good as it was based on the assumption that there was no slack in the system, an assumption contrary to facts in developing countries. Finally, while a monetary boost in developing countries is often inflationary, measures to enhance the mobility mechanism and a better

⁷ In Young increasing returns take the form of pecuniary external economies which are better transmitted in a more competitive system. Economies of the division of labour in industry benefit agriculture, and economies achieved in agriculture benefit industry through the vehicle of pecuniary external economies.

⁸ Young had talked about the role of monetary policy in controlling the business cycle. But he ignored monetary factors in his theory of growth and, for expository purposes, exclusively concentrated on the barter mechanism and the operation of reciprocal demand.

combination of factors are likely to pay much greater real dividends. The Currie-Kaldor exchange on increasing returns is taken up in more detail in Section 4.

3. Verdoorn's Law: An Assessment

Let p and q represent the growth rate of manufacturing productivity and output respectively, measured in logarithmic terms. Then Verdoorn's law states that

$$(1) p = a + bq; b > 0$$

where b is the Verdoorn's coefficient (a positive parameter) which in empirical studies takes the value of approximately 0.5 implying that a one percentage point increase in output leads to half a percentage point increase in productivity. Since by definition $p = q - e$ (where e is the growth rate of manufacturing employment), (1) can be rewritten as

$$(2) e = -a + (1-b)q$$

Or

$$(3) e = \alpha + \beta q; 0 < \beta < 1$$

While Verdoorn's Law is usually written as equation (1), Kaldor preferred to write it as (3) since he thought this equation particularly suited a situation where e was either zero or a constant, leading to a perfect correlation between p and q ; that is, where output and productivity grow at the same rate.

Rowthorn (1975), referring to Kaldor's (1966) Inaugural Lecture 'Causes of the slow economic growth of the United Kingdom', criticized Kaldor for implicitly regressing the growth of labour productivity (p) on the growth of employment (e) instead of on the growth of output (q). This substitution of e for q in equation (1) "is necessary when one is trying to understand the role of labour supply as a constraint on potential productivity". The regression of p on e is termed by Rowthorn as "Kaldor's Law" and is of the type

$$(4) p = a + be.$$

Rowthorn (1975, p. 11) further wrote:

Taking his law as established, Kaldor went on to argue that Britain's slow growth of industrial productivity has been caused by a chronic shortage of labour in this sector. Since Britain, unlike its rivals, does not possess a large surplus of agricultural labour available for employment in industry, he concluded that, if potential economies of scale are to be realized, labour must be found elsewhere. One potential source of labour is the service sector and to force labour out of this sector into industry Kaldor devised the

Selective Employment Tax (SET). More recently he has argued for export led growth on the grounds that this will concentrate labour in export industries, where substantial economies of scale can be realized. Thus, where SET was based upon the application of Kaldor's law to the entire industrial sector, the drive for export-led growth is based upon its application to the export subsector alone.

After the publication of Kaldor's 1966 lecture, several attempts were made to investigate Verdoorn's Law both theoretically and empirically. Rowthorn mentions two works in particular – S. Gomulka (1971) and Cripps and Tarling (1973). Gomulka provided theoretical and empirical arguments to suggest that technological diffusion from advanced to backward countries was an important determinant of technical progress, and the rate of diffusion itself is determined by social, cultural and political factors. For example, Japan geared its economic organization in an effective way to benefit from advanced knowledge from abroad resulting in tremendous productivity gains. To examine empirical evidence for Kaldor's Law, Gomulka plotted industrial productivity growth against employment growth in a scatter diagram for 39 countries during 1958-68 and failed to find any relationship between the two variables. Cripps and Tarling tested Kaldor's Law for a sample of 12 advanced countries for the period 1951-70. They were able to substantiate Kaldor's law only for manufacturing and only for a sub-period of 1951-65. In construction while there was a positive relationship between productivity growth and employment growth, it was weak and statistically insignificant. In case of public utilities it was significant but negative implying the inverse of Kaldor's Law. Moreover, the study can be questioned on the grounds that technical knowledge varied in 12 advanced countries considered at the starting point. For example, Japan was not an advanced country in 1950. Rowthorn (1975, pp. 18-19) concluded:

[T]here is no empirical evidence that Kaldor's law has operated during the post-war period in manufacturing. The confirmative results of Cripps and Tarling for 1951 to 1965 and of Kaldor for 1953-54 to 1963-64 simply cannot be accepted. They are based upon a small sample of countries chosen in such a way that the extreme observations of one special case – Japan – account for the bulk of observed correlation between productivity growth and employment growth. Moreover, Kaldor used an unconventional and seriously misleading method of estimation which gave results very different from those obtained by the conventional least squares regression of p on e .

In his reply, Kaldor (1975) maintained that he considered the significant relationship between e and q as the main test for deciding whether Verdoorn's Law was valid or not. According to Kaldor, the relationship between p and q "does not assert anything, since it is the automatic consequence of measuring the same thing twice over" (p. 892) since $q = p - e$. Kaldor further mentioned that in Verdoorn's equation for agriculture and commerce the regression coefficient

of p on q was around 1 – not a meaningful result. For manufacturing the results were meaningful whether Japan was included or not, and the regression coefficients of both p on q and e on q were around 0.5. Kaldor pointed out that he had nowhere mentioned that a statistically significant relationship between p and e is a necessary test of the Verdoorn law. Since output is the exogenous variable determined by demand, any error or disturbance would be reflected on p with the opposite sign, thereby generating a spurious negative correlation between p and e . Kaldor (1975, p. 892) concluded:

It follows that the existence of statistically significant relationship between p and q and e and q does *not* carry with it that the relationship between p and e is also statistically significant. The latter *may* happen, if the relationship between e and q gives a sufficiently close fit, but it would not hold if the latter relationship is not close enough. There is nothing very surprising therefore in the fact that it is by including Japan that the regression equation between p and e (as calculated by Rowthorn) is statistically significant...

Kaldor (1975) further mentioned that he had abandoned his earlier view that the slow rate of growth in the UK because of its maturity was mainly the result of shortage of labour. Kaldor stated that his change of position was due to new statistical evidence which had become available since 1966:⁹

Statistical studies that have since come to light make it doubtful whether I was correct in thinking that earnings in the service trades of the United Kingdom had come to be fully competitive with earnings in manufacturing or that the growth of manufacturing industry in the United Kingdom was constrained by labour shortages other than in purely short-term sense – e.g. of not having sufficient skilled labour in engineering to sustain a rapid expansion of engineering production (which from the long-run point of view is itself a consequence of low trend rate of growth of demand) (ibid., p. 895).

Verdoorn's (1980) article in *The Economic Journal* 'Verdoorn's Law in Retrospect: A Comment' stated that in 1949 he had "overlooked that the steady state requires the model to be solved for the asymptotic growth rates, at $t \rightarrow \infty$, of capital and output, as did, for example, Domar (1946). As a consequence, my final formula for productivity-output elasticity [η] is burdened by quite a few terms that vanish in the asymptotic case" (p. 382). Further: "The 'law' that has been given my name appears therefore to be much less generally valid than I was led to believe in 1949" (p. 385).

⁹ This change in Kaldor's position meant that even advanced economies such as the UK had surplus labour and were subject to dualism in the sense that labour from low productivity uses (like services) could be drawn into higher productivity manufacturing.

However, Kaldor (1981), as also noted by Turner (1993, p. 141), continued to declare his loyalty to Verdoorn's Law. He regarded it as essential to the existence of circular cumulative causation so crucial to the understanding of economic development but incompatible with neo-classical equilibrium theory (or general equilibrium). He also stated that the difference between him and those believing in neoclassical theory was essentially one of empirical assumptions.

In a symposium on Kaldor's growth laws published by the *Journal of Post Keynesian Economics*, Thirlwall (1983a, p. 341) stated that Kaldor's laws can be reduced to three generalizations: (1) the faster the growth rate of manufacturing, the faster the growth of national output, (2) the faster the growth of manufacturing, the faster the growth of labour productivity in manufacturing, and (3) the faster the growth of manufacturing, the faster the growth of productivity outside manufacturing. These laws – put forward to explain cross-country growth differences – were more relevant and their policy implications more pertinent, than the neoclassical approach where in the long run growth is determined by exogenously given long run growth of the labour force and exogenous technical progress. Thirlwall (1983b, pp. 352-4) also stated that Cripps and Tarling as well as Rowthorn wrongly interpreted Kaldor to mean that while manufacturing output growth was endogenous, employment growth was exogenous.¹⁰ Moreover, contrary to popular belief, Verdoorn's Law was not an indispensable element of the complete Kaldor growth model. Even if increasing returns were absent in manufacturing (which was difficult to believe), the growth of industry would still be the governing factor in determining overall growth as long as there was a net addition to the use of resources. Further, bringing in the external sector enhances the richness of the model (*ibid.*, p. 357), and balance of payments becomes a fundamental demand constraint in an open economy. In Thirlwall's opinion, even if Verdoorn's relation has broken down, it does not undermine the complete model.¹¹

4. Sandilands-Currie-Kaldor Exchange

Sandilands, a student of Currie, wanted to set up an exchange between Kaldor and Currie on increasing returns. Both Currie and Kaldor were students of Allyn Young but held different views on increasing returns. Currie hoped that the exchange between him and Kaldor, as noted by Sandilands (1990, p. 296), would lead to publication that could bring out more clearly their differences and agreements on increasing returns. But Kaldor never replied to Currie's last letter and publication did not result.

Sandilands wrote several letters to Kaldor seeking clarity on his views on several matters as well as apprising him of Currie's views. Internal balance between agriculture and industry

¹⁰ If growth is demand determined, employment growth is endogenous not exogenous.

¹¹ McCombie (1983), writing in the same symposium issue, concluded that after taking into account the recent literature there was no reason for altering Thirlwall's (1983b) conclusions.

confounded Sandilands who was very skeptical of the conventional wisdom on economic development which asserted a primordial need to generate an agricultural surplus (through all kinds of special aid programmes, rural development/employment projects, etc.) to fuel industrial expansion. In a letter to Kaldor dated 1 May 1977, Sandilands wrote:

It has always appeared to me that such strategies can cause great harm because of (i) the enormous 'surplus' rural population with incomes already far far below those in other sectors, and (ii) the low price and income elasticities of demand for food so that expanded output can simply depress farm prices and incomes and 'push' more farm labour to the cities in advance of job creation there.

It was therefore with great interest that I read your recent E.J. article, 'Inflation and Recession in World Economy' which appears to raise analogous doubts at the international level. In particular (pp. 705-6) you suggest that the 'stimulus to industrial demand on account of the rise in real incomes of urban workers resulting from the fall in food prices' was (and would usually be?) inadequate to offset the depression caused by falling incomes of primary producers. Unfortunately your precise reasons for believing in this asymmetry between the depressant and stimulatory effects on demand are not clear to me. Presumably it depends on which of the two income groups is quantitatively most significant, on the extent to which each group's real income is increased/depressed; and, perhaps, on their respective marginal consumption propensities.

In his reply dated 9th May 1977, Kaldor stated that he was glad that the ideas of Lauchlin Currie, whom he knew in Washington during New Deal days, seemed to run in the same direction as his. Kaldor stated that the asymmetry resulted because large increase in the profits of primary producers, consequent on increase in commodity prices, normally led to large financial savings, with investments occurring with a lag. A fall in income, consequent upon fall in commodity prices, led to rapid cuts in expenditure including on imports with a postponement (or suspension) of existing investment plans and activities. Kaldor further wrote:

I don't however agree with your propositions concerning policies to increase the 'agricultural surplus'. To my mind this is essential for industrial development on all the less developed countries, both as a source of outside demand, and as the 'inputs' of the industrial sector, because export demand which is the only alternative, can only emerge in the later stages of industrial development...¹² Of course an increase in agricultural output will not itself ensure that industrial development will be stimulated – it may be necessary to have a marketing board to ensure remunerative prices and to have

¹² Here Kaldor referenced Kaldor (1974) on the role of industrialisation in Latin American inflation.

protection for domestic industry so as to exploit development opportunities created thereby. But the main point is that no economic development which involves urbanization would be possible without it.

Sandilands, in a letter to Kaldor dated 13th May 1977, agreed that there must be food and raw materials from agriculture to support the growth of non-agricultural sectors, but for this prior expansion of agriculture was not necessary:

Currie's main point in his 'Leading Sector' article is that agriculture may well be a follower rather than a leader and that the tremendous productivity – increasing potential of the modern farm sector (in Colombia anyway) can be relied upon to produce the necessary goods provided that they are assured an effective demand. A Sayian type demand for their produce may be forthcoming if *real savings* (as distinct from monetary expansion) are mobilized and specially channeled into potentially 'leading' sectors such as, in the Colombian case, the construction and export sectors which played a very dynamic and successful role in the Colombian Development Plan 1971-4 [See Currie 1974b].

Sandilands wrote a further letter on 19th May 1977 explaining the rationale and criteria for choosing the leading sectors. While agriculture, because of its low demand elasticity, would qualify as a follower, its demand could be expanded if the overall economy is stimulated through the leading-sector strategy:

Currie stresses the endogenous nature of technical change and increasing returns as well as on the opportunities for liberating latent or potential demand for the output of leading sectors through exogenous institutional and policy changes (such as the new savings and loan corporations and urban development corporation in Colombia). This can provide the stimulus to an expansion of real saving to be channeled discriminatorially towards leading sectors to actualize latent demand for their product.

Apart from the ability to actualize latent demand through some such institutional change, these sectors are also selected largely according to the criterion that conventional price and income elasticities of demand are high. Agriculture, therefore, would not qualify since its conventional demand elasticities are very low. But agriculture can be assured a large increase in real demand if *other* sectors are pushed ahead. Agricultural expansion is also constrained by inadequate demand rather than by supply constraints; but demand for its products can best be mobilized as a consequence of greater overall economic activity. Agricultural marketing boards can help to stimulate an exogenous demand for agriculture but are likely to be only a palliative, not a substantial *dynamic* influence. In the absence of dynamic overall growth stimulus from the

potential leading sectors, special credit facilities etc. for agriculture will be like pushing on a string.

Contrast housing and construction. Demand for housing and urbanization of all kinds has been severely repressed cumulatively over many years: by inadequate financial institutions to capture funds for this purpose, by high down payments, by high nominal interest rates (that create severe financing problem for borrower even when real rates are very low or negative), and by short repayment periods.

Also contrast exports: repressed severely by over-valued exchange rates.

Both these sectors face a potentially common pool of latent demand if only it can be tapped by some exogenous policy/institutional change.

Housing and construction in particular have a tremendous spread potential both directly and indirectly through Sayian demand relations. It has a high local resource content (relatively low import content – See Currie, E.J. December 1971 on this)¹³, a heavy employment generating capacity, and, if modern capital intensive techniques are not eschewed, gives rise to ‘increasing returns and economic progress’...

Kaldor in a letter dated 27th May 1977 replied:

... I am very pleased that you liked my article on the Irrelevance of Equilibrium Economics, and I think you will find that it contains an important addition to Allyn Young’s ideas in that I show that ‘induced investment’ following upon a rise in supply is a necessary condition for an increase in the supply of commodity A to lead to an increase in the demand for commodity B etc.

However, I am very sorry that we still seem to be miles apart on the subject of agriculture. I do *not* believe that agriculture makes any response to the stimulus of demand by an increase in supply. On the contrary, as my original report on Chile in 1956 and the recent paper on Latin American inflation...show, it is the shortage of foodstuffs which was responsible both for comparative industrial stagnation and for chronic inflation.

If this is not the case in Colombia, I can only say that Colombia is in a very fortunate position in that she has not exploited her industrial growth potential. It is very easy to prevent a fall in agricultural prices due to over-production relative to demand by establishing a marketing board which pays fixed prices to the farmers and is ready to accumulate stocks. I do not regard this as a ‘palliative’ because it is through a process of

¹³ See Currie (1971).

generating a steadily increasing purchasing power in the farming population that 'Sayian' demand becomes operative.

You must also take into account that agriculture in most countries is in the hands of small farmers who are not commercially-minded, and who do not respond easily to economic incentives, and that just because land is an important factor of production in agriculture and not in industry, its supply is unresponsive to an increase in demand. On the other hand, an increase in the agricultural surplus would be an absolutely indispensable precondition of higher employment outside agriculture, whether in construction or in industry.

Though Kaldor stuck to his views on the importance of agricultural surplus as a precondition for industrialization or urbanization against the Currie-Sandilands view that agricultural expansion has to be demand based (in line with Sayian demand), and that agriculture can only be a following sector of growth, the Sandilands-Kaldor exchange set the stage for Currie and Kaldor to meet at Dubrovnik at a conference in November 1977. At the meeting, Kaldor emphasized the need to give priority attention to the primary sector to avoid cost-push inflation, for it was the food shortages, according to Kaldor, and not excessive money that was the main cause of inflation (see Sandilands 1990, pp. 294-96). As Sandilands also notes, Kaldor was well known for his detestation of monetarism of any description.

Kaldor, in response to an earlier letter by Currie, handed Currie at Dubrovnik his reply dated 24th October 1977 (reprinted in Sandilands 1990, pp. 296-98). He wrote:

Thank you very much for your letter of 2 September enclosing Chapter 14 of your forthcoming book, which I read with great interest. I was very glad to see that your 'paradigm' of the economy is so similar to mine, and that we both agree that economic development is mainly demand-induced and that demand which is relevant in this connection is derived from economic activity of other economic sectors at home or abroad, so that taking the world as a whole, growth is the result of an interaction between increases in demand induced by increases in supply, and increases in supply which arise in response to increases in demand.

I feel, however, that you may have misunderstood my comments on Allyn Young concerning the operation of this chain reaction. What I meant to say was that spontaneous increases in supply, for whatever cause...are always associated with an increase of *investment*, and not just the *flow* of production, and this is an integral component of the argument that an increase in the *supply* of a commodity A comes to the same as an increase in the *demand* for commodities B, C, D etc. A high 'elasticity of demand' in the sense used by Young does not do the trick by itself, since it merely

means that when more A is produced there is a sufficient substitution in favour of A as a result of the consequential fall in its price (but which also implies a corresponding fall in the demand for B, C, D...producers. However, it can be shown that increased production due to a *spontaneous* cause, such as the discovery of new oil fields, is *invariably* associated with an increased investment in new plant and machinery (in the form a larger carry-over of stocks, if nothing else) in the sense required to establish the simple proposition that the increase in the incomes of A-producers will not be cancelled by a corresponding decrease in the incomes of B, C, and D because *total expenditure* on goods will increase *pari passu* with the increase in activity in the A industry... The Keynesian element which was missing from Young is the fact that for total demand to increase, either exports or home investment must increase and in the Keynesian terminology an increase in exports is a *form* of increased investment.

On a practical plane I am not sure that I agree with you that the housing sector is a *promising* 'leading sector'. It is true that the import content of building materials etc. is small, but on the other hand housing does nothing to increase export potential, and the increase in incomes earned through greater housing activity, as well as the increase in incomes in other home industries due to its multiplier effects, are bound to lead to an increase in *imports*...

I am also a little skeptical of your proposition that the elasticity of supply of foodstuffs in a country like Colombia is high, so that it only needs an increased demand to bring about an increase in food production. If this is so, then Colombia contrasts sharply with other countries of Latin America. As regards the countries I do know something about (such as Chile, Brazil, Venezuela and even Argentine), this is certainly not the case. Indeed, it was the insufficiency of food supplies to meet the needs of growing urban populations which I think was the main factor behind the chronic inflation of some Latin American countries...

Kaldor's argument that there would be a substitution of purchasing power in favour of an elastically demanded good leaving less for other goods assumes that there is no slack in the system. In Currie's opinion, this was contrary to observed facts in developing countries which had underutilized resources. So Keynesian-type boosts to investment may not be necessary. In a letter to Kaldor dated 16th January 1978 (reprinted in Sandilands 1990, pp. 298-303), Currie wrote:

... But to turn to points of difference: You appear to feel that the stimulating effect of a 'leading sector', if any, arises entirely from the increased investment it generates and not from the flow of production. Otherwise, an increased supply of (or demand for) commodity A merely means a *shift* in demand from products B and C so that aggregate

demand (and supply) is no greater. However, you appear to feel that a spontaneous increase in supply-demand, like the discovery of an oil field, increases 'investment' and therefore is not at the expense of existing demand for other products.

On this point several comments may be made: Is there not, in your observation, an implicit assumption that there is no slack in the system – a useful expository assumption but hardly in accordance with reality, especially in LDCs? If the increased supply came from the work of previously underutilized factors, there need be no diminution in the aggregate production of goods and hence, in the Sayian sense, in aggregate demand nor a shift in demand... If there is no slack in the system, even an increase in 'investment' in one sector will only result in a substitution of demand and production, as in the case also of an increase in consumption; but if financing comes from outside the system, through the mechanism of a rise in prices, the only increase in aggregate supply (and demand in a real sense) would come from the presumed greater yield or productivity. So it is not the increase in investment in the Keynesian sense that is the key but the increase in output arising from (a) the economies of scale induced by actual growth (b) the taking up of slack (unemployed labour) or (c) the possible economies of more roundabout production (a special Harrod Domar case of increased productivity from division of labor and specialization)...

I distinguished two types of demand as desirable for the products of a sector which might qualify as a leader to which an exogenous stimulus might be given. The first was the existence of *latent* demand which for some reason is blocked or impeded, say by the absence of mortgage funds. Removing this impediment could give the initial impetus (in this case, to 'investment'). To prevent thereafter a quick saturation of the demand, a high income elasticity of demand is highly desirable. In the case of building, the combination of (a) removing the initial impediment (b) exploiting the high income elasticity of demand (c) utilizing previously underutilized capacity and (d) securing more economies of scale and obtaining the stimulus of a high price elasticity of demand, can lead to a large, long sustained stimulus to growth...

You appear to be sceptical of my findings of a high degree of agricultural elasticity of supply in Colombia, and particularly sceptical that it applies to other Latin American countries. The subject is too large and controversial to enter into any depth here. I can cite a few facts that I think are pertinent:

(1) There is admittedly an enormous degree of underutilized capacity in agriculture in Colombia and most other Latin American countries – especially labor, but also land and equipment.

(2) Despite constant campaigns and abundant and cheap credit at negative interest rates, agricultural production increased by little more than the increase in population and exports in the period 1950-73.

(3) The expansion of production in commercial farming in some crops has been spectacular (such as sorghum and soybeans) without any decrease in production of other crops or change (up to 1972) in the terms of trade of agricultural for non-agricultural goods.

(4) The gaps between the physical yields of crops per hectare between experimental, commercial and traditional farming, are very large...

It is, I think, true that Young was concerned to stress the real growth that arises from economies of scale and with the amplification of Adam Smith's dictum that the division of labour...is limited by the size of the (real) market. An implication of Young's treatment is that a rate of growth, whether low or high, tends to be self-perpetuating, but he was not concerned to explain the process by which one passed from a low to a high rate... The process is not dependent on an increase in investment though it may well be accompanied by an increase... Keynes, on the other hand, was, I think, more concerned, at least in the General Theory, with accounting and monetary concepts than with real things... If there is no slack, or there is cost-push inflation, there may still be increased 'investment', in the Keynesian sense, the effect of which is dissipated in higher prices with no increase in real output or growth.

In short, I would not agree that Young's treatment, for the task he set himself, suffered from the lack of Keynes' concept of investment. 'Real' investment was included by Young as one of the forms of specialization. Keynes' treatment, it appears to me, runs too exclusively in monetary terms to furnish an adequate theory of growth... I have always felt it unfortunate that the Keynesian model and terminology forces us to lump together as 'investment' such disparate things as capital expenditures, voluntary and involuntary increases in inventories, fiscal deficits and favorable trade balances... Successful stimulation of output in real terms may be combined with austere monetary and fiscal policies and appears to offer a means of combining high employment, rapid growth and price stability. That it may encourage a growth in imports is not a sufficient objection as *any* successful policy of raising the rate of growth will have this tendency. The problem is to combine high rate of growth with price stability...

Kaldor did not reply to this last letter, but continued to insist in his further writings on his earlier arguments and interpretations on Allyn Young. Currie (1981a, 1981b, 1997), on the other hand, continued to explore Young's subtle reasoning on 'increasing returns and economic

progress'.¹⁴

To summarise the discussion of this section, Kaldor thought that Young's reciprocal demand mechanism needed to be supplemented with Keynesian insights of monetary 'investment'.¹⁵ He also thought that increasing returns were confined to manufacturing and, in order to promote manufacturing, special favours to this sector were needed. At the same time Kaldor was also concerned with the problem of depressed agricultural incomes as it might pose a constraint on industrialization. He favoured a creation of agricultural surplus ahead of demand as this, according to him, would not only overcome the overall demand constraint but would also supply foodstuffs and raw materials for industrialization. He also advocated price support to farmers and the creation of agricultural marketing boards in this regard. He insisted that it was food shortages and not excessive money creation which explained inflation.

The Currie-Sandilands view on the other hand is concerned with boosting growth with price stability. It does not favour the creation of an agricultural surplus ahead of demand. According to this view the main constraint on agriculture is not on the supply side but on the demand side. Further, agriculture with its low income and price elasticities, cannot be a leading sector but benefits if other sectors, particularly construction and exports, expand first. While Kaldor made much of Verdoorn's Law, the Currie-Sandilands framework discounts it because it does not favour manufacturing as the leading sector, let alone the protection and subsidies which go along with it. Both manufacturing and agriculture follow in response to the leading sectors. Kaldor also sees foreign exchange and labour shortages as constraints to industrialization.¹⁶ The Currie-Sandilands framework on the other hand sees no such constraints as less developed countries are characterized by underutilized resources including labour. Also, foreign exchange

¹⁴ In an unpublished paper 'Economic growth and demand management', Currie (1979) further distinguished between monetary demand management (in the Keynesian sense) and real demand management. While the former refers to matching saving and investment at the existing levels (or where growth in money incomes is kept in line with real output), the latter refers to matching saving and investment at a sustained high level (and can be used to increase employment and output in the chosen leading sectors). He wrote: "Demand management must be interpreted in dealing with real as well as monetary demand. It is perfectly conceivable that the policy may simultaneously call for restraint of demand in the monetary sense and its stimulation in the real sense" (p. 28). Currie further states: "Only rarely and by accident, especially in LDCs, will market forces, unaided, permit the actual rate of growth to be near its potential for any lapse of time or ensure the correspondence between saving and investment at a sustained high level. The interest rate cannot be relied upon to do this. The broad classification of sectors into which investment may be stimulated exogenously and those in which it can be relied upon to follow the growth in the market can simplify and aid in the task of demand management or growth guidance" (ibid., pp. 28-9).

¹⁵ Kaldor was deeply influenced by the Keynesian Revolution in the aftermath of the Great Depression of the 1930s and therefore wanted to supplement Young's growth analysis with Keynesian insights. As Laidler (1999, pp. 3-4) tells us, this revolution itself turned into an orthodoxy for none existed earlier.

¹⁶ As mentioned earlier, Kaldor backtracked from his view that labour shortages posed a constraint to the UK economy. But he continued to maintain that balance of payments posed a real constraint which was later formalized by Thirlwall (1979). See also Thirlwall (1986, 2011, pp. 562-65).

is not a constraint once exports can be promoted in a market friendly (and outward-oriented) framework which does not discriminate between exports and production for the home market¹⁷.

5. Summary and Conclusions

Summing up Kaldor's applied growth ideas, Thirlwall (1987a, pp. 545-6) writes:

As Kaldor grew older (and perhaps wiser?), he lost interest in theoretical growth models and turned his attention instead to the applied economics of growth. Two things particularly interested him: first, the search for empirical regularities associated with 'interregional' (country) growth rate differences, and secondly, the limits to growth in a closed economy (including the world economy). The distinctive feature of all his writing in this field was his insistence on the importance of taking a sectoral approach, distinguishing particularly between increasing returns activities on the one hand, largely a characteristic of manufacturing, and diminishing returns activities on the other (namely, agriculture and many service activities). Kaldor's name is associated with three growth 'laws' which have become a subject of extensive debate. The first 'law' is that manufacturing industry is the engine of growth. The second 'law' is that manufacturing growth induces productivity growth in manufacturing through static and dynamic economies of scale (also known as Verdoorn's Law). The third 'law' states that manufacturing growth induces productivity growth outside manufacturing, by absorbing idle or low productivity resources in other sectors. The growth of manufacturing itself is determined by growth of demand, which must come from agriculture in the early stages of development, and from exports in the later stages. Kaldor's original view was that Britain's growth rate was constrained by a shortage of labour, but he soon changed his mind in favour of the dynamic Harrod trade multiplier hypothesis of a slow rate of growth of exports in relation to income elasticity of demand for imports, the ratio of which determines a country's balance of payments constrained growth rate. Because fast growing 'regions' automatically become more competitive *vis à vis* slow growing regions, through the operation of the second 'law', Kaldor believed that growth will tend to be a cumulative disequilibrium process – or what Myrdal once called a 'process of circular and cumulative causation' – in which success breeds success and failure breeds failure.

As is clear from the preceding paragraph, Kaldor had a two sector framework in mind. For him the industrial sector was the increasing returns sector where Verdoorn's Law describing the

¹⁷ In the literature two types of trade strategies have been distinguished: inward oriented (which favours domestic production over exports) and outward oriented (which is neutral between domestic production and exports).

relationship between productivity growth and scale of output applied. So the industrial sector had to be promoted through policy even in an advanced country like Britain where the industrial revolution was achieved without any protection.

The agriculture sector, on the other hand, was the diminishing returns sector. But it had to provide an agricultural surplus in the form of foodstuffs and raw materials for industrialization. Also, depressed incomes in agriculture could hold back industry due to a demand constraint. So policy intervention was thought to be the appropriate remedy by giving price support to farmers through agricultural marketing boards that should be prepared to hold stocks.

But why does the need to give price support to farmers arise in the first place? The original mistake is to protect and subsidise industry. Studies on effective rates of protection demonstrate that protection to industry necessarily implies disprotection (or negative effective protection)¹⁸ to agriculture and exports. Protection to industry also tilts the terms of trade against agriculture depressing farm incomes. So the need to support farmers and exporters arises because the protection to industry tilts the incentive structure against them. The picture gets murkier if dirigiste policies such as dual exchange rates, selective employment and expenditure taxes, etc. are thrown into the mix. The resulting brew may well be a recipe for disaster sure to compromise on growth and efficient resource allocation whether static or dynamic.¹⁹

Currie's 'leading sector' strategy²⁰ identified construction and exports as potential leading sectors based on the criteria that (a) a sector should possess 'latent' or hidden demand waiting to be actualized, (b) it should be capable of being stimulated exogenous of the overall growth rate. No favours (protection or subsidies) are required to stimulate these sectors but only removal of institutional barriers such as making available suitable financial products in the case of housing (to keep the down payments and subsequent installments spread over a long period of say 15-20 years to reasonable amounts) and overcoming the constraint posed by overvalued exchange rates in case of exports. In this strategy agriculture and manufacturing are the following sectors; it also does not require the creation of an agricultural surplus ahead of demand. Once the market is made to work in the leading sectors by 'handicap removal', the increased incomes generated there are bound to lead to increased real expenditures on industrial and agricultural products. Moreover, housing has an important backward linkage with construction materials industries (often with a low import content), and would be able to reap

¹⁸ For studies on effective rates of protection that can greatly exceed the nominal rates that disguise the true extent of potential market distortions, see Little et al. (1970) and Balassa (1971).

¹⁹ The post-war development experience bears this out – those countries which gave a greater chance to the market forces (and outward orientation) prospered, and those which followed extreme import substitution strategies declined in performance. See World Development Report (World Bank, 1987) and Dollar (1992).

²⁰ For an appraisal of Currie's 'leading sector' strategy see Chandra (2006).

the economies of scale once housing takes off. Rosenstein-Rodan's (1943, 1961) 'big push' automatically becomes a reality through this approach. Currie did not refer to Verdoorn's Law directly but was clear that manufacturing in developing countries was not suitable as the leading sector. Currie stated that if growth begets growth, it also begets the financing of growth through company profits and retained earnings. So no outside injections of investment or monetary demand are required as in Kaldor.²¹

The evidence for Verdoorn's Law is at best mixed, and Verdoorn himself in his 1980 paper made it clear that his law did not have as general a validity as he had earlier believed. Evidence suggests that it is possible for agricultural productivity (but not output, which reflects lower demand elasticity) to grow many times faster than that in manufacturing as in the US during 1947-84. Young himself did not regard the law of diminishing returns as useful for prophesying the prospects of agriculture as the agricultural fields of newer lands had been brought closer to the older world through revolution in transportation and technical change in agriculture.

Moreover, the logic of Verdoorn's Law of favouring manufacturing to the detriment of other sectors distorts intersectoral relationships, leads to adverse terms of trade for agriculture, and is likely to pose a demand constraint for industry itself. To undo one distortion (i.e., protection to industry), one has to match it with other distortions such as price support and marketing boards in agriculture, and dual exchange rates to promote exports. The whole economic system becomes an intricate maze with adverse consequences for overall growth and productivity.

References

Balassa, B. (1971), *The Structure of Protection in Developing Countries*, Baltimore: John Hopkins University Press.

Balassa, B. (1980), 'The process of industrial development and alternative development strategies', Princeton University International Finance Section, *Essays in International Finance*, No. 141, pp. 4-12.

Buchanan, James M. and Yong J. Yoon (2000), 'A Smithian perspective on increasing returns', *Journal of the History of Economic Thought*, 22(1), pp. 43-48.

Chandra, Ramesh (2006), 'Currie's leading-sector strategy of growth: an appraisal', *Journal of Development Studies*, 42, pp. 490-508.

²¹ Currie felt that a theory of growth is different from that of business cycles. Although additional money may help the barter system to work out more smoothly, the Keynesian mechanism diverts attention from endogenous forces of growth to exogenous elements. "What a theory of growth has to explain is the underlying but strong tendency toward increasing returns in the whole economy, so that deviations from the trend are largely self-correcting" (Currie 1997, p. 419).

Chandra, Ramesh (2019), 'Nichlas Kaldor on Adam Smith and Allyn Young', *Review of Political Economy*, Published Online on 19 November, DOI: 10.1080/09538259.2019.1685789

Chandra, Ramesh (2020), *Allyn Abbott Young*, London: Palgrave Macmillan.

Clapham, J.M. (1922), 'On empty economic boxes', *Economic Journal*, 32, pp. 305-14.

Cripps, T.F. and R.J. Tarling (1973), *Growth in Advanced Capitalist Economies 1950-70*, Cambridge University Press.

Currie, Lauchlin (1971), 'The exchange constraint on development: a partial solution to the problem', *Economic Journal*, 81 (December), pp. 886-903.

Currie, Lauchlin (1974a), 'The 'leading sector' model of growth in developing countries', *Journal of Economic Studies*, 1, pp. 1-16.

Currie, Lauchlin (1974b), 'The Colombian Plan 1971-74: a test of the leading sector strategy', *World Development*, 2(10-12), October-December, pp. 69-72.

Currie, Lauchlin (1979), 'Economic growth and demand management', mimeo, *Departamento Nacional de Planeación*, Bogotá, Colombia (March).

Currie, Lauchlin (1981a), 'Allyn Young and the development of growth theory', *Journal of Economic Studies*, 8(1), pp. 52-60.

Currie, Lauchlin (1981b), *The Role of Economic Advisers in Developing Countries*, Westport: Greenwood Press.

Currie, Lauchlin (1997), 'Implications of an endogenous theory of growth in Allyn Young's macroeconomic concept of increasing returns', *History of Political Economy*, 29, pp. 413-443.

Dollar, David (1992), 'Outward-oriented developing economies really do grow more rapidly: evidence from 95 LDCs, 1976-1985', *Economic Development and Cultural Change*, 40(3), pp. 523-44.

Domar, E. (1946), 'Capital expansion, rate of growth and employment', *Econometrica*, 14 (April), pp. 137-47.

Ely, Richard T., Thomas S. Adams, Max O. Lorenz and Allyn A. Young (1923), *Outlines of Economics*, New York: The Macmillan Company.

Gomulka, Stanislaw (1971), *Inventive Activity, Diffusion and the Stages of Economic Growth*, Aarhus.

Government of U.S. (1986), *Economic Report of the President*, Washington D.C.: U.S. Government Printing Office, pp. 302, 361.

Kaldor, Nicholas (1966), *Causes of the Slow Rate of Economic Growth in the United Kingdom*, Cambridge: Cambridge University Press.

Kaldor, Nicholas (1974), 'The role of industrialisation in Latin American inflation', In David T. Geithman (ed.), *Fiscal Policy for Industrialization and Development in Latin America*, Gainesville: University Presses of Florida, pp. 14-28.

Kaldor, Nicholas (1975), 'Economic growth and Verdoorn's law: a comment on Mr Rowthorn's article', *Economic Journal*, 85 (December), pp. 891-96.

Kaldor, Nicholas (1981), 'Discussion', in D. Currie, A.R. Nobay and D. Peel, (eds.), *Microeconomic Analysis*, London: Croom Helm.

Laidler, David (1999), *Fabricating the Keynesian Revolution*, Cambridge: Cambridge University Press.

Little, I.M.D., T. Scitovsky and M. Scott (1970), *Industry and Trade in Some Developing Countries*, London: Oxford University Press.

Marshall, Alfred (1890), *Principles of Economics*, London: Macmillan.

McCombie, John S. L. (1983), 'Kaldor's laws in retrospect', *Journal of Post Keynesian Economics*, 5(3), pp. 414-29.

Rosenstein-Rodan, Paul (1943), 'Problems of industrialisation in eastern and south-eastern Europe', *Economic Journal*, 53, pp. 202-11.

Rosenstein-Rodan, Paul (1961), 'Notes on the theory of the big push', in H.S. Ellis and H.C. Wallaich (ed.), *Economic Development of Latin America*, London: Macmillan.

Rowthorn, R. E. (1975), 'What remains of Kaldor's Law?', *Economic Journal*, March, pp. 10-19.

Sandilands, Roger J. (1990), *The Life and Political Economy of Lauchlin Currie*, Durham and London: Duke University Press.

Smith, Adam (1776), *An Inquiry into the Nature and Causes of the Wealth of Nations*, Edwin Cannan (ed.), Chicago: University of Chicago Press (1976).

Thirlwall, Anthony P. (1979), 'The balance of payments constraint as an explanation of international growth rate differences', *Banca Nazionale del Lavoro Quarterly Review*, March.

- Thirlwall, Anthony P. (1983a), 'Introduction', *Journal of Post Keynesian Economics*, 5(3), pp. 341-44.
- Thirlwall, Anthony P. (1983b), 'A plain man's guide to Kaldor's growth laws', *Journal of Post Keynesian Economics*, 5(3), pp. 345-58.
- Thirlwall, Anthony P. (1986), 'A general model of growth and development on Kaldorian lines', *Oxford Economic Papers* (New Series), 38(2), pp. 199-219.
- Thirlwall, Anthony P. (1987a), 'Nicholas Kaldor 1908-1986', *Proceedings of the British Academy*, LXXIII, pp. 517-66.
- Thirlwall, Anthony P. (1987b), *Nicholas Kaldor*, Washington Square: New York University Press.
- Thirlwall, Anthony P. (2011), *Economics of Development*, Ninth Edition, London: Palgrave Macmillan, Chapter 16, pp. 562-65.
- Turner, Marjorie S. (1993), *Nicholas Kaldor and the Real World*, New York: M.E. Sharpe.
- Verdoorn, P.J. (1949), 'Fattori che regolano lo sviluppo della produttività del lavoro', *L'Industria*, 1, pp. 3-10.
- Verdoorn, P.J. (1980), 'Verdoorn's Law in Retrospect: A Comment', *Economic Journal*, 90(358), June, pp. 382-85.
- World Bank (1987), *World Development Report*, New York: Oxford University Press.
- Young, Allyn (1928), 'Increasing returns and economic progress', *Economic Journal*, 38(152), 527-42.
- Young, Allyn (1990), 'Nicholas Kaldor's notes on Allyn Young's LSE lectures 1927-29', *Journal of Economic Studies*, 17(3/4), pp. 18-114.